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FLOOD INSURANCE STUDY

TOWN OF CHURCH CREEK, MARYLAND
DORCHESTER COUNTY

ORIGINAL

OCTOBER 18, 1988

Federal Emergency Management Agency

COMMUNITY NUMBER - 240101

COMPLETED

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
TOWN OF CHURCH CREEK, DORCHESTER COUNTY, MARYLAND

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Town of Church Creek, Dorchester County, Maryland, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by the State of Maryland Water Resources Administration, Flood Management Division, during the preparation of the Flood Insurance Study for the unincorporated areas of Dorchester County.

1.3 Coordination

On November 6, 1986, a final Consultation and Coordination Officer's (CCO) meeting was held with representatives of the Federal Emergency Management Agency (FEMA) and the town to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Church Creek, Dorchester County, Maryland. The area of study is shown on the Vicinity Map (Figure 1).

Tidal flooding from Church Creek inundated by the Chesapeake Bay was studied by detailed methods. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

2.2 Community Description

The Town of Church Creek is located in Dorchester County on the eastern shore of Maryland. It is completely surrounded by the unincorporated areas of Dorchester County.

The eastern shore is characterized by slight topographic variation. The topographic change is so slight that the standard 20 feet contour interval is too large to accurately reflect the topography. The eastern shore is also characterized by irregular shorelines, bordered by extensive tidal flats and estuaries.

The climate of the area is humid and semi-continental. The winters are mild, and the summers are hot. The prevailing winds are westerly at an average speed of 8 to 10 miles per hour (mph). The average annual temperature within Dorchester County is 56 degrees Fahrenheit (^{o}F). The highest recorded temperature of 107^{o}F occurred on September 1, 1933. The lowest recorded temperature of 6^{o}F occurred in 1934 and again in 1961. July is the hottest month of the year, while January and February are the coldest months with an average temperature of 27^{o}F (Reference 1). A growing season of 6.5 months is characteristic for this area.

2.3 Principal Flood Problems

Storm damage in the Town of Church Creek has resulted from severe thunderstorms that blow in over the Chesapeake Bay and from tropical storms and hurricanes that follow a north bound route along the Atlantic coastline.

In August 1933, a tropical storm with more than 50 mph winds struck the town and surrounding county. Tidal surges were estimated between 6.9 and 7.5 feet in the area (Reference 2). In October 1954, Hurricane Hazel left tidal surges ranging from 5.5 feet to 6.0 feet (Reference 3). A severe storm also occurred in July 1975. Tides were estimated to peak at 6 feet above normal.

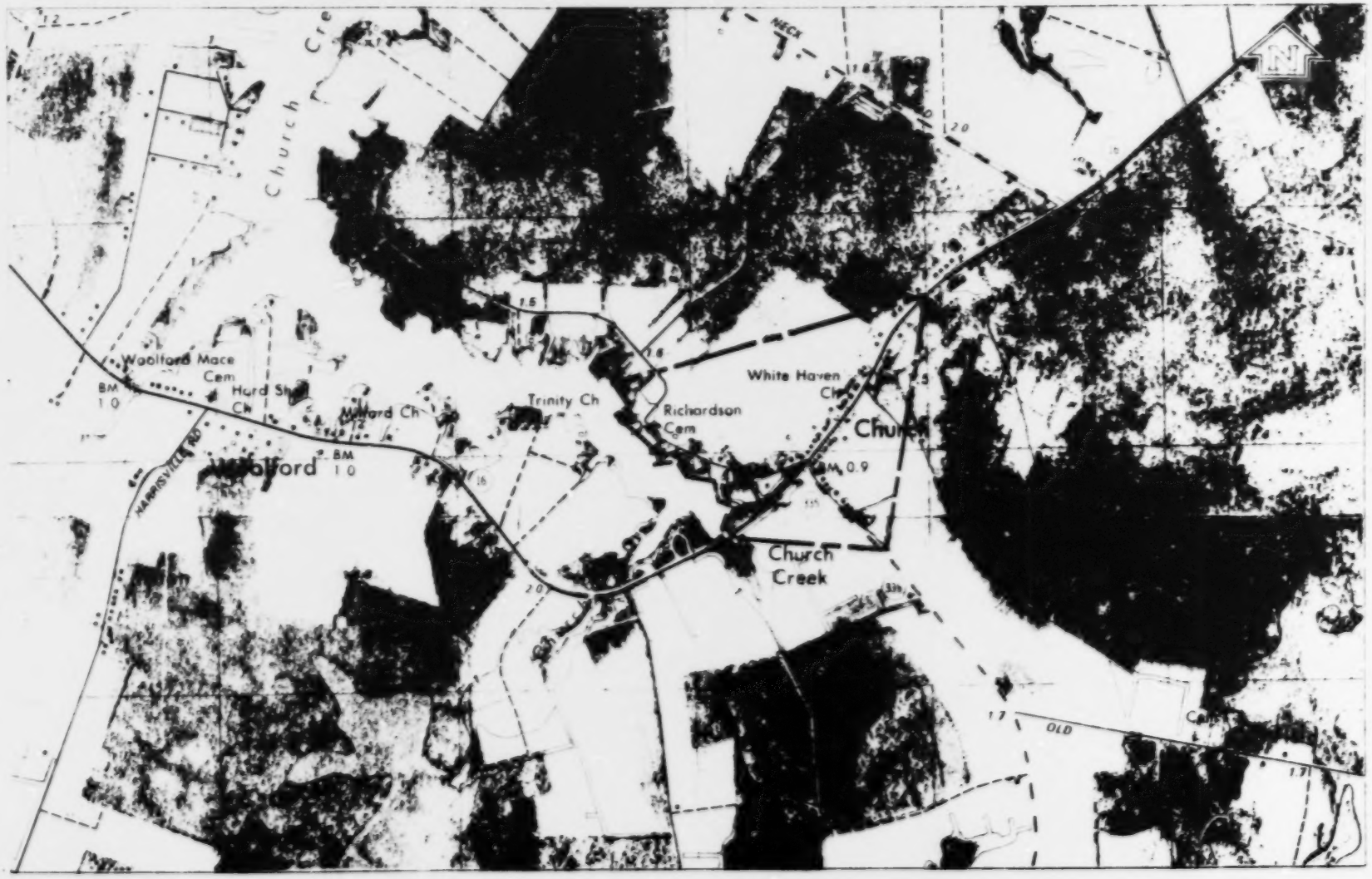

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF CHURCH CREEK, MD

(DORCHESTER CO.)

APPROXIMATE SCALE

2000 0 2000 4000 6000 FEET

VICINITY MAP

BEST COPY AVAILABLE

3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Analyses were carried out to establish the peak elevation-frequency relationships for the flooding source studied in detail affecting the community.

Stillwater elevations for Church Creek were obtained from the Flood Insurance Study for the unincorporated areas of Dorchester County (Reference 4). These stillwater elevations were determined for various frequency relationships by the Virginia Institute of Marine Science (VIMS) storm surge models (Reference 5). The relationships were computed by using a finite element, hydrodynamic computer model of the Chesapeake Bay and the Virginia offshore area of the Atlantic Ocean (Reference 5). The model utilized meteorologic, topographic, and bathymetric input to generate and modify storm surges. This general input included the astronomical tide, the inverted barometer effect, wind stress acting on water-surface, coastal configurations, bottom topography, bottom friction, internal stress, and discharge and surface elevations of rivers. The compilation and analysis of these data were accomplished using a high-speed digital computer that forecasts peak elevations. Bathymetric data were derived from standard bathymetric charts published by the U. S. Coast and Geodetic Survey (Reference 6).

Specific input parameters developed by VIMS include bathymetric data recorded and coded for computer use, historical storm events analyzed for their probability of occurrence where known and unknown elevations were identifiable, astronomical tides (periodic rise and

fall of the water surface resulting from gravitational interactions between the sun, moon, and earth) were mathematically described, and orthogonal segments were designed to describe coastal configurations. The model was verified and calibrated by known water-surface elevations and measured storm surges from field data and gage records.

The stillwater elevations for the 10-, 50-, 100-, and 500-year floods have been determined for Church Creek and are summarized in Table 1, "Summary of Stillwater Elevations."

TABLE 1 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CHURCH CREEK				
Entire shoreline within community	3.9	5.1	5.9	7.5

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the tidal areas, the 100-year floodplain boundary has been delineated using topographic maps at a scale of 1:24,000 with a contour interval of 1 meter (Reference 7).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 1). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zone AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood

hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

A Flood Insurance study for the unincorporated areas of Dorchester County has been published (Reference 4). The results of this study will be in exact agreement with the results of that study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

1. State of Maryland, Geological Survey, Water Resources of Dorchester and Talbot Counties, Maryland, Report of Investigations No. 17, Annapolis, Maryland, 1971.

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3. The Banner, Cambridge, Maryland, October 16-19, 1954; August 13, 1955; August 17-18, 1955; June 22, 1972; June 26-27, 1972; July 14, 1975.

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5. Virginia Institute of Marine Science, A Storm Surge Model Study, Volumes I and II, Gloucester Point, Virginia, June 1978.

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